

Figure 1

10/30

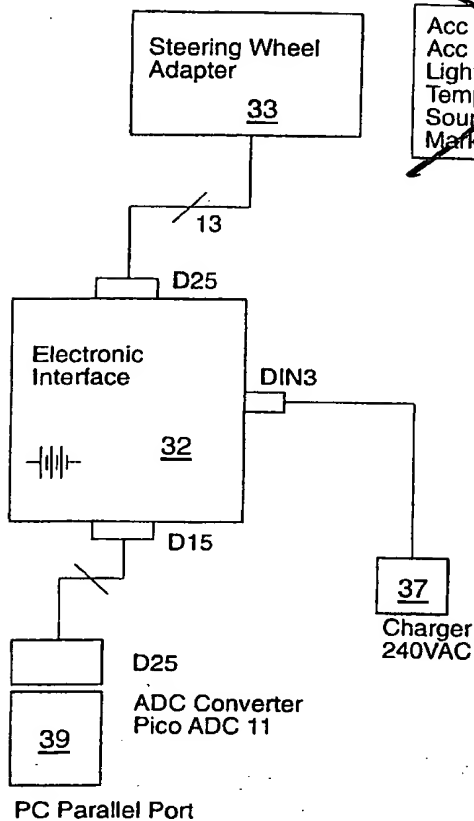
S.N. 09/341,093
Group 2736

Figure 10

Table 1

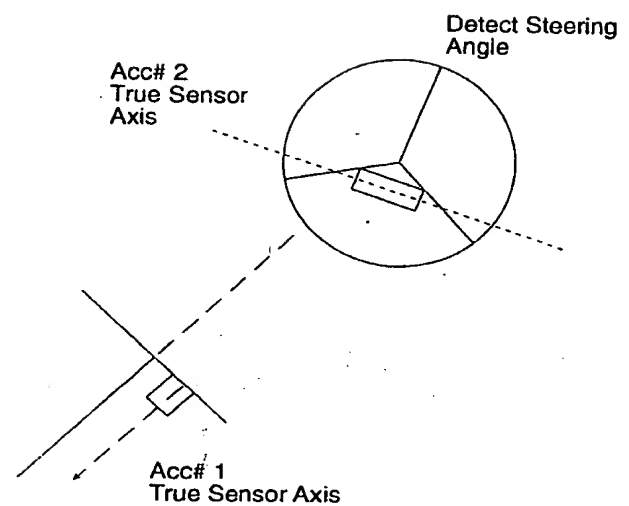
~~| |
|------------------------|
| Acc # 1-Vehicle Motion |
| Acc # 2-Wheel Angle |
| Light Sensor - Ambient |
| Temp Sensor - Ambient |
| Sounder |
| Mark Button |~~


Figure 11

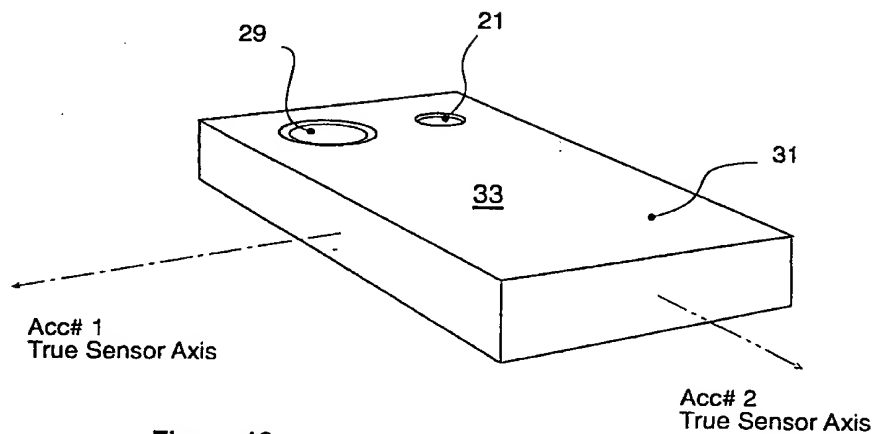


Figure 12

12/30

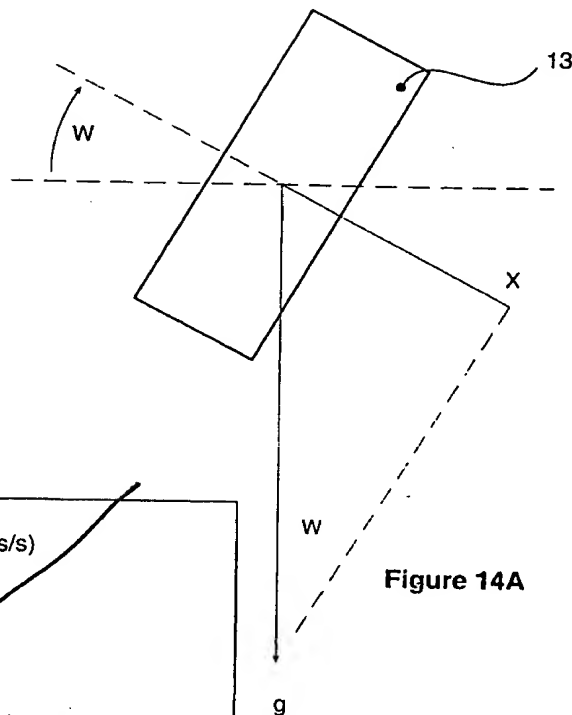
S.N. 09/341,093
Group 2736

Figure 14A

Table 2

W - Wheel Rotation Angle

X - Measured component of g in sensor axis (m/s/s)

K wheel - Sensor scaling factor (mm/s/s/bit)

g - Gravity 9.81 m/s/s

g - Gravity Vector Component in wheel Plane

$$\sin W = X / g$$

$$X = k \text{ wheel} / 1000 \times (\text{Ch}(1)\text{-ZeroWheel}) \times 1/\cos(\text{Alpha})$$

$$\sin W = k \text{ wheel} / (1000 \times g) \times (\text{Ch}(1)\text{-ZeroWheel}) \times (1/\cos(\text{Alpha}))$$

$$W = \text{ArcSin} [K\text{wheel} / (1000 \times g) \times (\text{Ch}(1)\text{-ZeroWheel}) \times 1/\cos(\text{Alpha})]$$

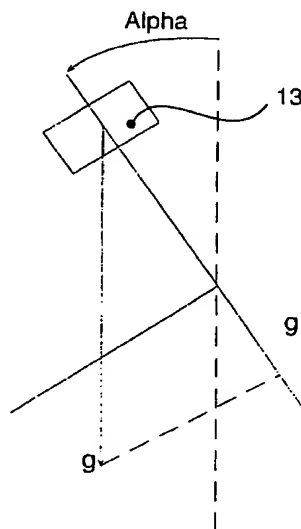
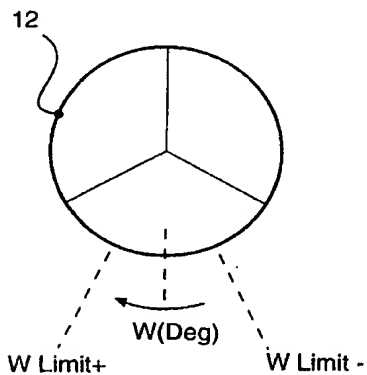
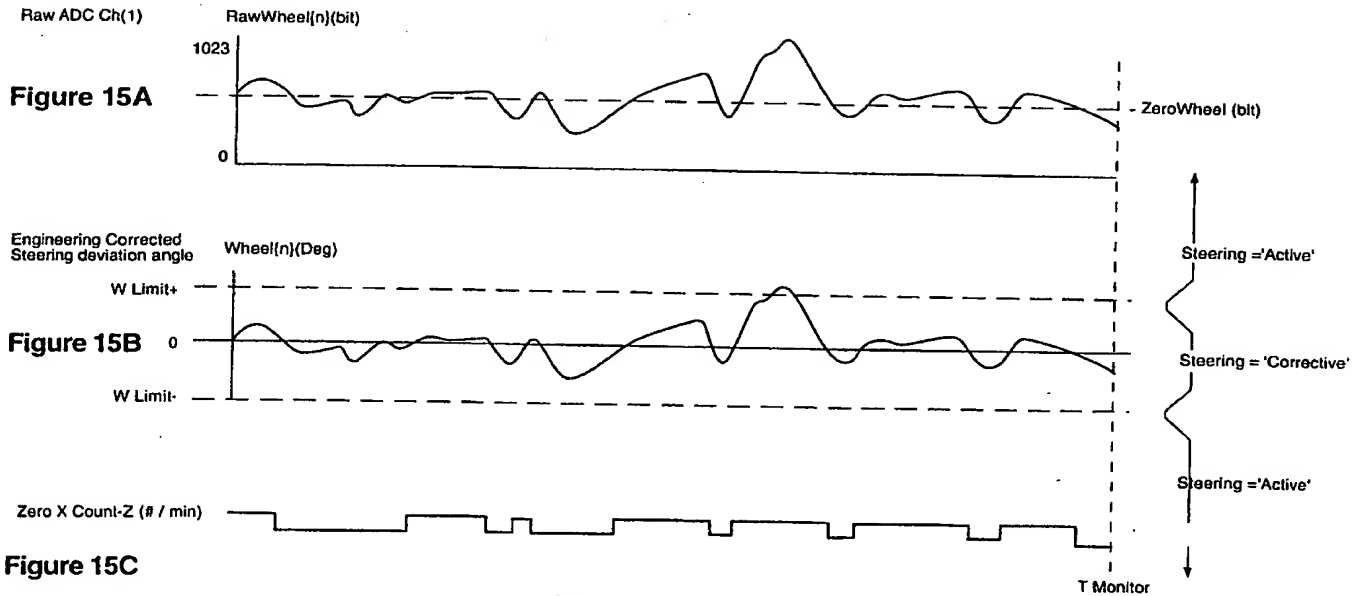


Figure 14B

~~Table 3~~

~~$$\text{RMS Steering Angle} - R(\text{Deg}) = \sqrt{\frac{\sum \text{Wheel}(n)^2}{n}}$$~~

~~Table 4~~~~Bound Check~~
~~W Limit- < W < W Limit+

W < W Limit-

W > W Limit+~~
~~Steering Mode=Corrective

Steering Mode=Active

Steering Mode=Active~~
Figure 15D

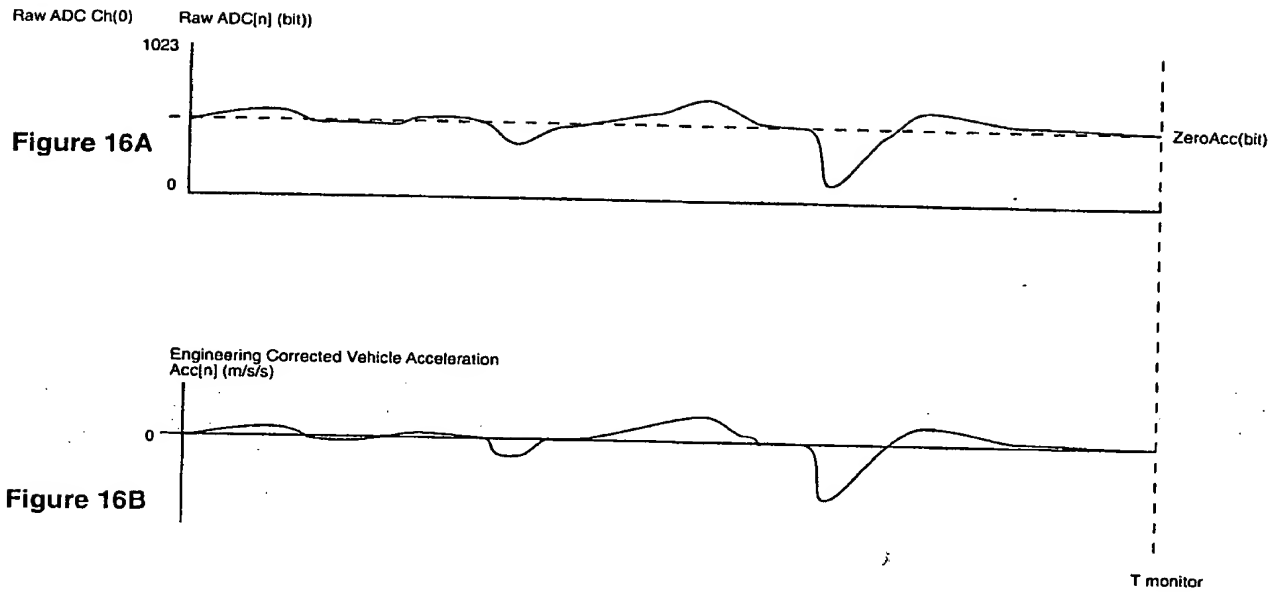


Table 5

$$\text{RMS Vehicle Acceleration } G(\text{m/s/s}) = \sqrt{\frac{\sum \text{Acc}[n]^2}{n}}$$

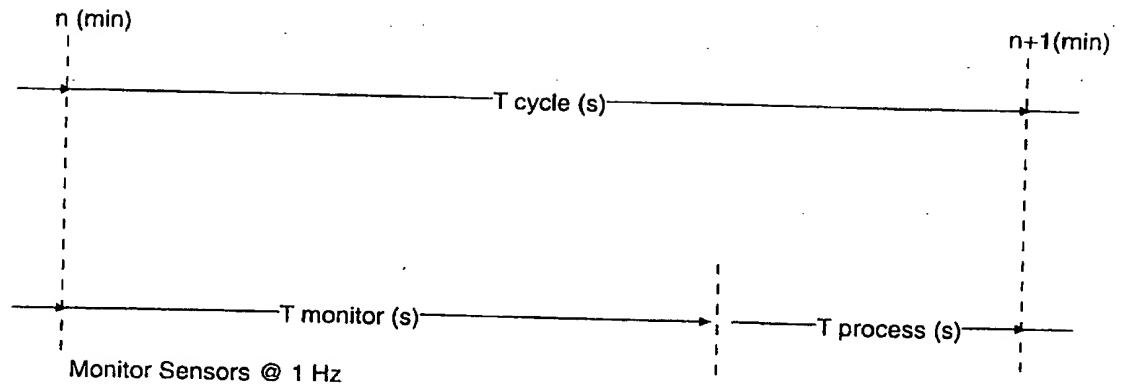


Table 6

$T \text{ cycle} = 60\text{s}$
 $T \text{ monitor} = 50\text{s}$
 $T \text{ process} = 10\text{s}$

Calculate Parameters
Test & Issue Warnings
Update Screen Display
Store Sensor Data > Disk
Store Calculated Parameters > Disk

Figure 18

Figure 19

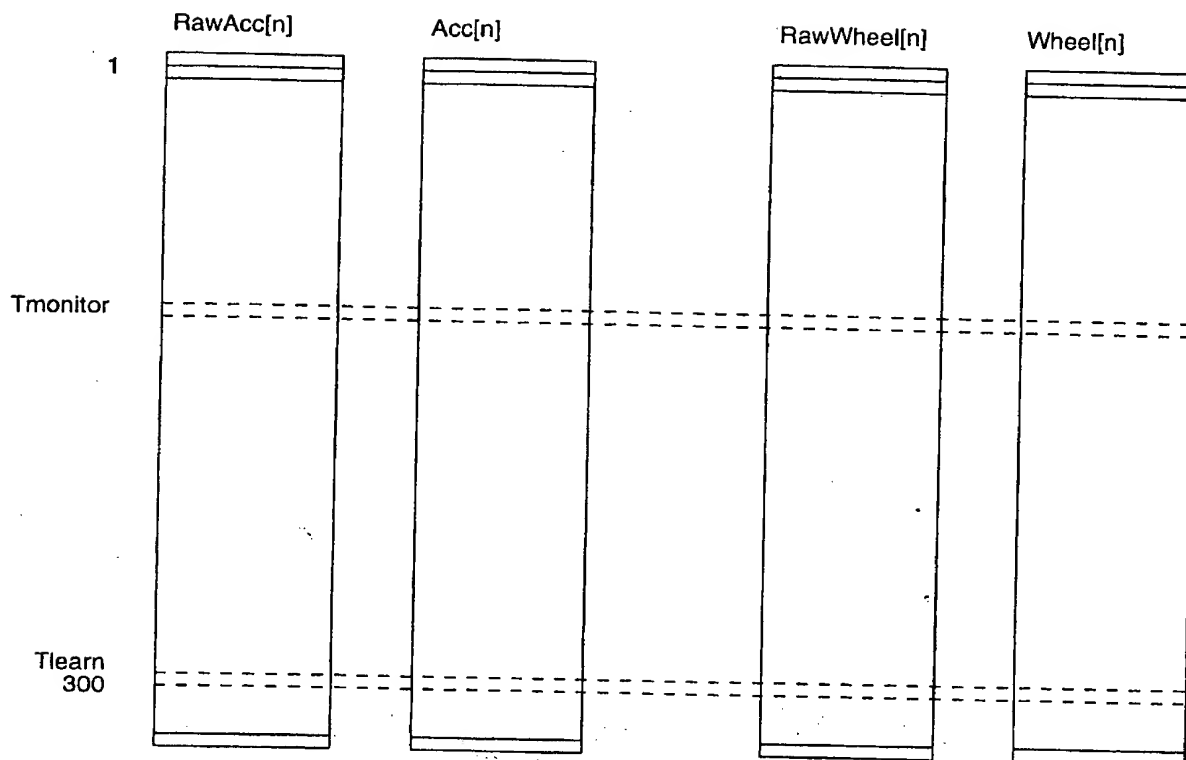


Table 7

Note:

Data storage @ 1Hz

ZeroAcc=Average (RawAcc[n])

ZeroWheel=Average (RawWheel[n])

Ch(n)=Raw ADC Value (bit)

Table 8

$$\text{Acc}[n] = K_{\text{acc}}/1000 \times (\text{RawAcc}[n] - \text{ZeroAcc}) \times 1/\cos(\alpha)$$

(m/s/s) (mm/s/s/bit) (bit) (bit)

$$\text{Wheel}[n] = \arcsin [K_{\text{wheel}}/(1000 \times 9.81) \times (\text{RawWheel}[n] - \text{ZeroWheel}) \times 1/\cos(\alpha)]$$

(Deg) (mm/s/s/bit) (bit) (bit)

$$I = K_{\text{light}}/1000 \times (\text{Ch}(2) - \text{ZeroLight})$$

(KLx) (Lx/bit) (bit) (bit)

$$T = K_{\text{temp}}/1000 \times (\text{Ch}(3) - \text{ZeroTemp})$$

(DegC) (mDegC/bit) (bit) (bit)

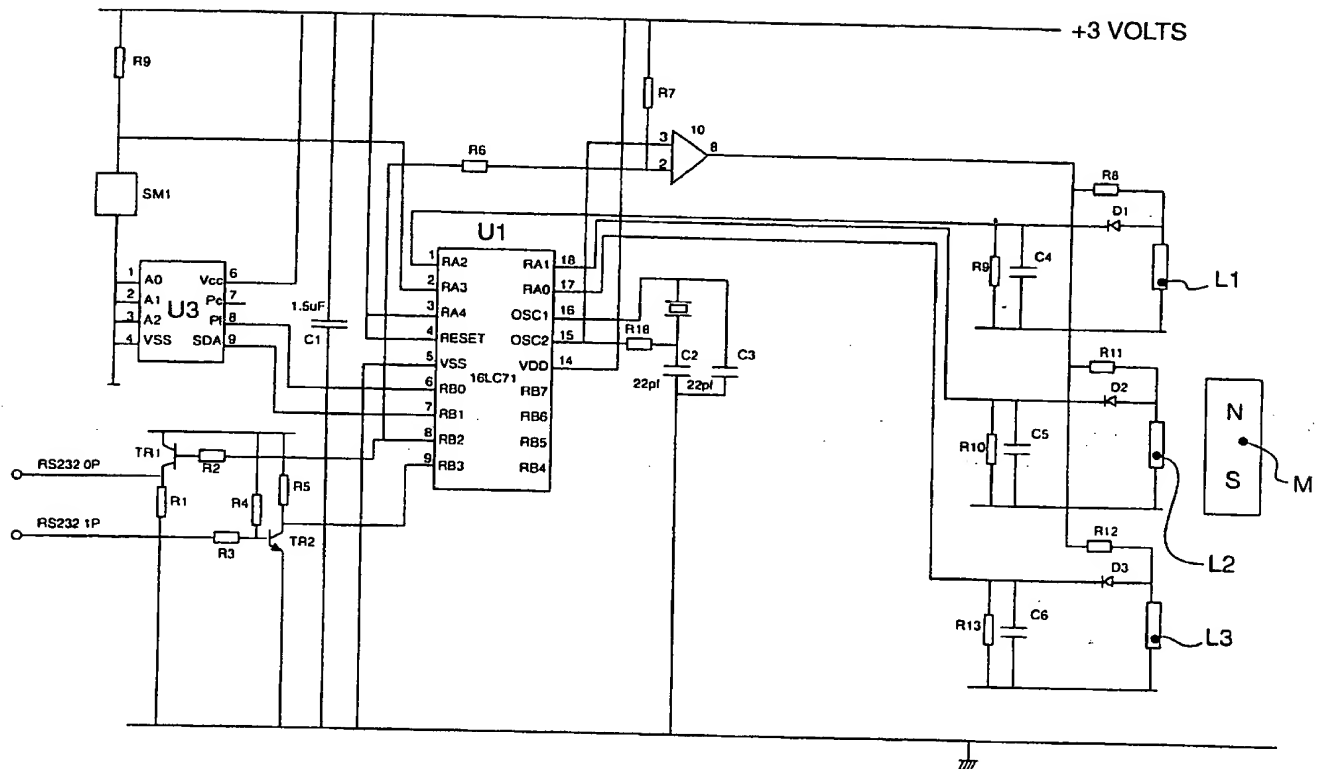


Figure 20